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Texas Agricultural Extension Service

SOUTH
TEXAS
RANGELANDS

Spanish Goat Management

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Introduction

Spanish Meat goats have been popular with ranchers in South and West Texas for many years. Many ranches keep a herd for a variety of uses including brush control, weed management and meat or cabrito production.

Spanish goats are hardy and able to withstand the rigors of extensive production on Texas rangelands. They are prolific, commonly producing twins and triplets. The Spanish goat has a wider range of adaptability than the Angora goat or any of the dairy goat breeds and is successfully produced in all areas of Texas. Most of the Spanish goats in Texas however are located in the Edwards Plateau Region of the state (Central Texas) with South and West Texas accounting for the majority of the remaining goats.

Spanish goats come in a variety of colors and patterns, and most of these animals, both male and female, are horned. Few attempts have been made to improve the animals by selective breeding, but dairy breed influence has been used to increase the size and milk production of the native does and their kids.

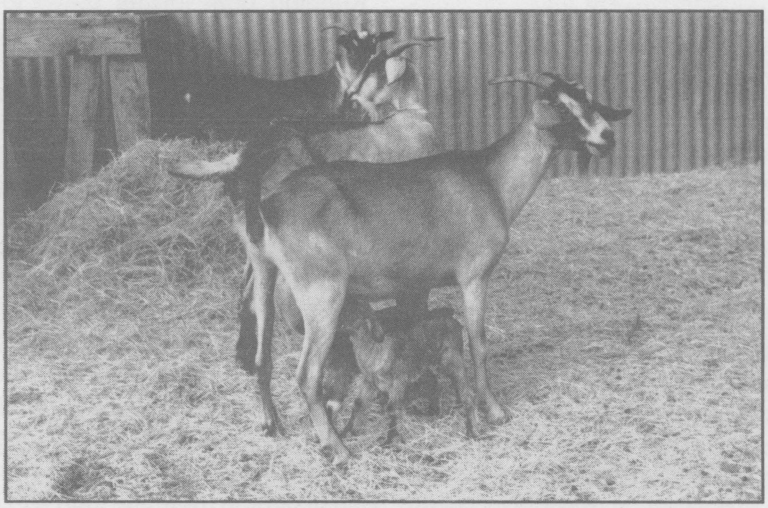
Since the Spanish goat is not usually the principal or sole enterprise on Texas ranches, good management and husbandry practices are not often utilized to their fullest extent. Marketing management, except in certain specialized cases, is virtually nonexistent due to the seasonality of production, a lack of expertise and a lack of a well-developed marketing channel for live animals, carcasses and cuts. This bulletin will help existing producers improve their management skills, and allow new producers to enter the industry at a higher level of understanding and skill.

Fencing and Facilities

Fencing

Because goats are a curious and active animal, adequate fencing is a must if the animals are to be contained and managed effectively. The type of fence used will depend on many factors, such as the kind of goats, the size of the operation, the topography and type of range, predator pressure and whether the fence is temporary or permanent.

The three basic types of fence are woven or net wire, barbed wire or



A Spanish Meat Goat

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electric. A combination of net wire and barbed wire is the most common type of fence used. Perimeter fences should be a minimum of four feet tall with one strand of barbed wire on the bottom next to the ground, at least three or more feet of net wire, and one to three strands of barbed wire above the net wire. Net wire fence of 12-inch mesh rather than 6-inch mesh should be used to keep goats from getting their heads hung. Although it is not recommended, barbed wire fencing can be used with a minimum of six strands; however, the more strands used the greater the possibility the fence will be goat proof. Electric fencing shows promising results especially when three to five strands are used to crossfence or temporarily divide pastures. Wooden staves can be added between permanent posts to help tighten wire and make fences more goat proof.

Facilities

When designing working facilities for goats it must be remembered that goats will move toward freedom, follow one another or move toward another goat. When goats become frightened they tend to move away from buildings and resist dark barns, alleys and chutes. Goats prefer lighted areas, flow better around slight corners or curves and prefer to move uphill, toward a horizon.

Pen and corrals. Since goats become nervous when confined, pen and corral fences should be five to six feet high to prevent goats from jumping. Net wire or galvanized panels with four-by-four inch openings are generally used.

Working chutes. Working chutes should be narrow enough to present goats singly. A 12-inch wide chute is adequate; however, a chute that is made so the width can be adjusted is beneficial when working small goats and kids or large bucks. The sides of the chute should be smooth and solid. Also, goats tend to work better in chutes that are slightly curved.

Sheds. Sheds are needed to provide protection from inclement weather, especially during kidding. Sheds should provide a minimum of five square feet of floor space per goat, should face away from the prevailing winds and be closed on two or three sides. Most sheds are set low to the ground so the body heat from the animals will collect and help keep them warm. Care should be taken to prevent goats from piling up and smothering.

Predators and Predator Control

Predators are perhaps the primary constraint to expanding meat goat production over most of South Texas. South Texas has the dubious honor of being home to the highest population of coyotes in the U. S. Further, high populations of other predators, including bobcats, free-ranging dogs and feral hogs, along with lower populations of eagles, mountain lions and other predators, ensure that predation on livestock will be a real management concern.

Keeping goat losses down to a reasonable level requires knowledge of the major predator species and their population trends. Excellent references that should be consulted include *Coping with Coyotes: Management Alternatives for Minimizing Livestock Losses* (TAEX Bulletin B-1664) and *Procedures for Evaluating Predation on Livestock and Wildlife* (TAEX Bulletin B-1429). These references provide information on recognizing predator signs and killing behavior. Also, they provide a more indepth analysis of control methods than can be outlined here.

Predator control techniques fall into one of two broad categories: lethal or nonlethal. Lethal methods often employed in Texas include traps, snares, shooting and poisons. Nonlethal means include guard animals, fencing and herding and penning. Most situations require a combination of lethal and nonlethal methods. Because of the presence of the endangered jaguarundi and ocelot in far South Texas, certain lethal control methods such as traps, snares and M-44 devices may be unlawful. Check with your local county Extension agent to determine if your county is affected.

The first line of defense against predators is a netwire fence in good condition. Good fencing helps keep out some predators and funnels the activity of others where they can be removed with traps or snares. An electric "tripwire" located six to ten inches outside the fence about eight inches above the ground is a good way of keeping predators from digging under. Electric "predator fences" have excluded coyotes in some instances, but such fences require constant maintenance and may be cost-prohibitive or impractical.

Typically, kids are most vulnerable to predators, but adult animals may also be taken year-round. Night penning and kidding in protected pastures can help curb losses, but may not be practical. The use of guard animals has increased recently, with dogs and donkeys the most common choices. Success varies among individual ranchers, but tends to be best in smaller pastures. Spanish goats sometimes disperse in a pasture, making a single guard dog's task more difficult. Consult your local Texas Department of Agriculture representative for more information regarding the use of guard animals. The use of guard dogs may preclude the use of certain lethal methods like

snares, traps and poisons in the same pastures.

All lethal methods of control require special skills or training in order for the user to become proficient. Steel traps and snares are both effective, but incorrect use may "educate" more animals than they remove. The M-44 device, a mechanical device that ejects sodium cyanide, is fairly selective for canids (coyotes, dogs and foxes) and is most effective during winter months. The Livestock Protection Collar, which employs the poison Compound 1080, kills coyotes when they attack goats or sheep and bite the neck at the lower jaw, the typical killing behavior of coyotes. Users of both M-44's and Livestock Protection Collars must be trained and certified by the Texas Department of Agriculture. Aerial gunning from a helicopter is a good means of reducing the local coyote population quickly. Aerial gunning is regulated by state law, and a permit is required. Shooting from the ground, usually in conjunction with calling, can be effective in some instances.

For more information relative to predator control, consult the references mentioned above. Additional assistance can be obtained from your local representative of the Texas Animal Damage Control Service, with district offices located statewide.

Grazing Management

The use of goats to harvest vegetation from rangeland can increase both animal production and plant harvest efficiency. A complex interaction of factors, including both animal and plant characteristics, determine the particular forage species selected by browsing goats. Some factors affecting selection include forage quality and availability, animal anatomy, topography, physical plant properties and animal competition.

The development of Spanish goat production systems to meet producer objectives are dependent upon a knowledge of goat diet preferences, habits and requirements. This information is used to set stocking rates, grazing periods and seasons of grazing.

Diet Preferences

All animals feed selectively and the goat is no exception. However, goats spread their grazing pressure more evenly over all vegetation classes than do cattle or sheep. This is a function of grazing preferences and behavior, forage availability and past use of the range. In general, however, goats prefer and select browse (shrubs) over other vegetation classes (Table 1).

Browse consumption remains high throughout the year but there is a tendency to alter diets with changing seasons and forage activities. More grasses are consumed during the spring and fall growing seasons than during the summer or winter. Forbs may be highly used or relatively unimportant in the goat diet depending upon their availability.

Goats also consume a large quantity and variety of plant species. This is an indication of the diversity of available forages as well as preferences. A few species may compose the bulk of the diet, but different kinds of plants are selected over others in varying amounts under each grazing situation. The catclaws appear to be preferred almost everywhere as does spiny hackberry and various oak species. Lime pricklyash and wild olive are preferred in some locations but not in others.

This variety of dietary species is important in deciding whether goats will be an appropriate enterprise for a particular kind of forage resource or whether brush management objectives can be met. Spanish goats are opportunistic selectors and this behavior must be considered in the decision process.

Table 1.Composition of Goat Diets by Forage Class at Four Locations

	Percent Botanical Composition		
Location	Grass	Forbs	Browse
College Station	18	5	77
Kerrville*	16	9	75
Sonora**	46	10	44
Tilden	37	5	58

* Average of two studies
**Average of three studies

Stocking Rates

Range carrying capacity and stocking rates are commonly expressed as Animal Units (AUs) or the equivalent of one mature cow. Calculations of these equivalents are based on diets, metabolism, weights, ages and size. According to metabolic size, six goats equal one AU. Twenty goats equals one AU when diet composition is considered. An average of 10-12 Spanish goats per AU probably should be the basis for stocking decisions in South Texas.

Range carrying capacities vary with forage demand of goats and the availability and quality of the required forage. Spanish goat stocking rates should be flexible

and based upon range carrying capacities. In typical South Texas mixed brushland the average carrying capacity is between one to two acres per adult goat. This may be adjusted if a deferred rotation system of grazing is used.

Brush Management

Goats are efficient biological brush management tools. However, the effectiveness of goats in a program is dependent upon plant size and species composition, goat stocking rates and frequency of browsing. The degree of brush control desired is a necessary consideration in any decision process. High stocking densities, frequency of defoliation and proper timing are directly related to degree of control. The manager must match intensity of browsing with intensity of the brush problem.

Use of goats in combination with other brush management treatments can increase the effectiveness, extend the life and increase net returns from the treatment. Chemical and mechanical manipulation prior to browsing also improves goat accessibility by thinning dense stands and topkilling individual plants. Resprouts also provide larger quantities of nutritious browse for Spanish goats.

Sustained heavy grazing pressure by Spanish goats can greatly reduce brush stands. However, since grazing pressure also impacts grasses and forbs, it increases competition with deer and other livestock. Spanish goats can reduce brush without harm to grasses and forbs when browse quantity is relatively small as compared to amounts of grasses and forbs present. Goats should be stocked to control brush regrowth but more than 50 percent of desirable browse should not be used. Browse lines should be avoided as this may be detrimental to other livestock and some wildlife species.

Supplemental Pasture

Although Spanish goats do well under range conditions, complementary pastures may be used to provide forages at different growing seasons during the year. Cultivated pastures, such as coastal bermudagrass, buffelgrass and kleingrass can complement native grasses in the warmer seasons. Small grains, such as ryegrass, oats and wheat, may be options for cool season grazing. A diversity of grasses, forbs and browse provides the best diet throughout the year if available.

Crops such as sorghums, corn and forage legumes may be specifically planted for harvesting, feeding or grazing. Also, by-products of food crops such as beans, peas, grains and corn may be fed to Spanish goats.

Poisonous Plants

In general, the loss of goats through poisonous plants is a result of a shortage of desirable range forage. Poisonous plants are generally low in palatability, so most poisoning occurs when animals are forced by hunger, mineral deficiencies or a lack of familiarity to graze these plants.

Prevention of poisoning should be practiced where possible. Goats should not be allowed to browse in pastures supporting dense stands of poisonous plants with little or no available forage. Do not allow goats to reach a low plane of nutrition or remain hungry. If possible, remove poisonous plants by mechanical or chemical methods.

Plants poisonous to goats in South Texas include sneezeweed, coyotillo, oaks, silverleaf nightshade, mountain laurel and perennial broomweed.

Affected animals should be removed from further access to the poisonous plants and provided feed, water and shelter as soon as the condition is recognized. Specific antidotes are available for some poisons but others require symptomatic treatments. A veterinarian should be contacted for specific diagnosis and treatment.

Reproduction

Goats are considered to be seasonally polyestrous animals in that they have reoccurring estrous cycles every 20 to 21 days during the months of August through January. Very few does cycle in March and April, while February, May, June and July are considered transitional months. Estrous tends to last 24 to 36 hours with ovulation (one to three ovum) occurring near the end of estrus. The gestation period is 148 to 150 days. Goats tend to reach puberty or sexual maturity at five to nine months of age provided they have been well grown out.

Both bucks and does may be sexually inactive at certain times of the year. Although bucks will produce sperm year round, during the spring months sperm number is reduced resulting in lower fertilizing capacity. The libido or mating desire of most bucks is also lower during this time.

The presence of the buck - sight, sound and smell - causes the does to come into estrus. A buck may breed 50 to 200 does in a single breeding season. However, it is generally recommended that three or four bucks be put with 100 does. This recommendation is made because too many does may be in estrus at one time, a buck may be sterile or have no libido, the terrain is rough or the pasture is large and the does are spread out over a large area.

If does are thin at breeding time, kidding percent can be increased by flushing. Flushing is the practice of increasing nutrition during breeding which puts the animal in a weight gaining condition and causes an increase in ovulation rate. Flushing can be done by turning goats on a fresh, lush pasture if it is available or by feeding grain. Corn is most often fed at the rate of 1/2 to 3/4 of a pound per head per day. Feeding should be initiated two to three weeks before the bucks are turned with the does and continued for two to three weeks after the bucks are turned in for a total of four to six weeks. Flushing will generally result in a 10 to 20 percent increase in kid crop. Does that are in good condition will generally not benefit from flushing.

Most goat producers kid once per year; however, accelerated programs where goats are kidded more than once per year can be used, but the goats require improved nutrition and management. In an accelerated program fewer kids are born at a time due to out of season breeding; however, an increase in total kid crop often results from more kiddings per year. If cashmere production is a factor in your program, then the goats should be sheared soon after kidding as kidding usually causes fibers to shed. Most producers kid only once per year, but many kid to meet unique marketing dates.

Dystocia (difficult birth) is rare with goats. Most kidding difficulties result from mal-presentations in which case assistance should be provided. Loss of kids generally results from cold stress, starvation, predation, poor mothering ability and infection or disease.

Selection

There are a number of well-established breeds of goats in the U. S. Most of these are either of the dairy types, such as Alpine, Nubian, Saanen, Toggenburg and Lamancha, or fiber type, such as Angora. Other breeds and types include the Spanish goat or brush goat, Nervous goat, including the scare goat, Tennessee Wooden or Stiff Legged goat, and the Pygmy or Dwarf goat. The Spanish goat is the goat of choice for meat production in Texas. Although they are generally not uniform in appearance or meet few of the requirements of a breed and do not represent a highly selected population, there is a possibility their meat production capabilities can be increased. This might be done in several ways:

1. Select within the Spanish goat population to establish a more uniform and improved type.
2. Introduce Nubian into Spanish goat flocks and select to improve the type from this heterogeneous population with a 1/4-1/2 blood cross.
3. Introduce meat goat breeds such as the Boer as a pure strain or to cross with the Spanish goat flocks.

The selection program should rely on the individual selection of yearling or older males that emphasizes traits the rancher considers to be most important. Selection of the does, especially on large commercial ranches, will be less intense and should emphasize only one or two traits such as reproduction and soundness, with a simple record keeping system like ear notching. Remember that selection response is lowest when selection is made for more than four or five traits. These traits in the Spanish goat might be size and scale, weight, muscling, adaptability, reproductive or twinning rate, cashmere, milk for increasing weaning weights, color or polledness. If possible, birth, weaning and yearling information should be collected on all males to establish superiority or inferiority of potential sires. All of these traits except accelerated kidding rate, adaptability and possibly milk production have moderate to high heritability and should be easy to change with selection.

Selection should be practiced for the desired traits in the environments that the goats will be raised since adaptability is negatively related to high productivity. Keeping males and females from does with high kidding rates or twins will improve overall flock fertility over time. Selection for growth rate and meat production should be a high priority in Spanish goats but not carried to an extreme. Culling nonproductive males and females should be practiced in both purebred and commercial operations, but less strict culling on other characteristics such as size and growth rate may be more desirable in commercial operations in order to reduce replacement requirements and maximize economic returns.

Follow a good selective breeding program. Mate the best does to the best bucks, second best does to the second best bucks and poorest does to the poorest bucks. Save replacements from the top two groups. Bucks should be changed often to prevent inbreeding in the flock. Changing bucks every two years should prevent loss of vigor in the flock.

Bucks should have good conformation, large size and be muscular. The ability to grow rapidly from birth to weaning is essential.

The points to be considered in a selective breeding program include:

1. Large size
2. Multiple birth
3. Accelerated kidding
4. Good conformation (good muscling)

5. Rapid growth

6. Straight legs with good bone

Points of lesser importance include: color, horned or polled, type of ears and type of coat, whether it's long or short hair.

Culling points such as weaknesses of conformation, bad mouth, bad udders, or weak feet and legs also should be considered.

Nutrient Requirements

The nutrients required by goats are energy in the form of carbohydrates and fats, protein, minerals, vitamins and water. These nutrients must be provided in adequate amounts to meet requirements for maintenance, body activity, growth, milk production and fiber production.

Energy. An adequate supply of energy is necessary for efficient utilization of nutrients. An energy deficiency will result in small kids, delayed puberty, reduced fertility, low milk production and reduced resistance to infectious diseases and parasites. Low energy intake may result from inadequate feed intake or from a low-quality diet.

Protein. The primary constituent of the animal body is protein, therefore, protein from the diet serves to maintain or replace protein in body tissues, provides for carriers of other nutrients and is a major component of various products such as meat, milk and fiber. A protein deficiency will result in retarded fetal development, low birth weights, decreased kid growth and depressed milk production.

Minerals. Minerals can be classified as major or macro minerals and minor or trace minerals. The major or macro minerals must be provided in large quantities and include calcium, phosphorus, sodium, chlorine, magnesium, potassium and sulfur. Of these, phosphorus is the mineral that is most often deficient under range conditions. The ratio of calcium to phosphorus is also very important and should be 1.5-2 calcium to 1 phosphorus. Under range conditions a mineral supplement that is high in phosphorus should be provided as salt is generally fed free choice, sodium and chlorine are not a problem. Minor or trace minerals are required in small amounts and include iron, iodine, copper, molybdenum, zinc, manganese, cobalt, selenium, chromium, nickel, vanadium, silicon, tin and arsenic. Generally, there is not a problem with trace minerals.

Vitamins. Vitamins are required by animals in very minute amounts, however, they are essential for proper body function. Of all the vitamins, only vitamin A is likely to ever be deficient. Deficiencies are likely to occur during severe, extended dry periods when little or no green forages are available.

Water. Water is the most critical and limiting nutrient of all. Water should always be clean, fresh and well distributed. A lack of water will result in decreased feed intake and reduced productivity.

Nutrient Requirements During Production

The yearly production cycle of the goat can be divided into the following periods: 1) dry period, 2) breeding period, 3) early gestation (first 100 days), 4) late gestation (last 50 days) and 5) lactation. The nutrient requirements change depending upon the stage of production of the goat.

Table 2 contains the daily nutrient requirements for Spanish goats at various weights and stages of pro-

Table 2. Daily Nutrient Requirements for Spanish Goats

Body Weight lb	Dry Matter lb	TDN lb	Crude Protein lb	Calcium lb	Phosphorus lb
Dry Does and Does in First 100 Days Gestation					
60	2.4	1.3	.24	.006	.004
80	3.2	1.7	.31	.008	.005
100	4.0	2.1	.37	.011	.007
120	4.8	2.4	.43	.014	.009
Does in Last 50 Days Gestation					
60	2.7	1.6	.30	.007	.004
80	3.6	2.1	.39	.009	.006
100	4.5	2.5	.46	.012	.008
120	5.4	2.9	.54	.016	.010
Lactating Does					
60	3.0	1.9	.36	.009	.006
80	4.0	2.5	.47	.012	.008
100	5.0	3.0	.57	.016	.011
120	6.0	3.5	.66	.020	.013
Growing Kids and Yearlings					
20	1.0	.7	.14	.003	.002
40	2.0	1.3	.26	.005	.004
60	3.0	1.8	.36	.008	.005
80	4.0	2.3	.44	.011	.007

Table 3. Required Composition of Diets for Spanish Goats (expressed on a 100% dry matter basis)

Body Weight lb	TDN %	Crude Protein %	Calcium %	Phosphorus %
Dry Does and Does in First 100 Days Gestation				
60	56	10.0	.24	.16
80	54	9.7	.26	.17
100	52	9.3	.27	.18
120	50	9.0	.29	.19
Does in Last 50 Days Gestation				
60	60	11.0	.24	.16
80	58	10.7	.26	.17
100	56	10.3	.27	.18
120	54	10.0	.29	.19
Lactating Does				
60	64	12.2	.29	.19
80	62	11.7	.30	.20
100	60	11.3	.32	.21
120	58	11.0	.33	.22
Growing Kids and Yearlings				
20	68	14.0	.27	.18
40	64	13.0	.27	.18
60	60	12.0	.27	.18
80	58	11.0	.27	.18

duction. Table 3 contains required composition of diets for Spanish goats.

Dry Period. Between weaning and breeding the doe is in a nonproducing dry state. Nutrient requirements are at their lowest and does can be fed a maintenance diet. The only concern is that the weight lost during lactation should be recovered before the next breeding season.

Breeding Period. The practice of flushing does at breeding to increase kidding percent has already been discussed under the reproduction section.

Early Gestation. After breeding, the nutritional requirement for the next 100 days is not critical because the fetus grows very little during this time. During this period does can be fed at maintenance level or slightly above.

Late Gestation. The last 50 days of the gestation period are very critical nutritionally as 70 percent of fetal growth occurs during this time. Protein and energy requirements increase quite drastically. Also, late gestation normally occurs during January and February when range conditions are not good. The supplemental feeding program is most critical at this time and must be given serious attention.

Lactation. The greatest nutritional requirement of the goat is during the lactation period. Normally, the lactation period coincides with the spring of the year when adequate quantity and quality of forage is available. The first eight weeks of the lactation period are most critical. Milk production in the doe will peak at two to four weeks and then start to decline quite rapidly. Also, by eight weeks of age the rumen in the baby goat has developed so that it can digest roughage material, and it is no longer as dependent on its mother's milk.

The nutrition of bucks is often overlooked. Bucks should be placed on an increased plane of nutrition approximately six weeks before breeding so that they will be in condition to stand the rigors of mating a large number of does with a minimum of problems.

Weaning

Spanish meat goat kids are generally weaned at three to five months of age. Most kids are never vaccinated, however, a few producers do vaccinate for sore mouth and enterotoxemia (overeating disease) at two to four weeks of age. Since most kids are marketed at less than four to five months of age and at live weights of less than 50 pounds they are not castrated. If male kids are to be retained but not for breeding purposes they are castrated at weaning.

Kids are generally sold as true cabrito (less than one month of age), at weaning (three to five months of age), or sometime in between. If kids are weaned at an early age (less than 60 days) care should be taken in drying up the does so as not to spoil their udders. Kids that are kept after weaning are usually the doe kids that will be used for replacements or for breeding stock to be sold when they are a year old.

Replacement Doe Management

Producers generally replace 15 to 20 percent of their breeding does each year. Replacement doe kids are selected at weaning time which is four to five months of age.

In your selection program high priority should be given to multiple births, early born kids, and kids from does that kid more often than once per year. Accelerated kidding programs of three kid crops every two years are quite common in Spanish goats.

Doe kids should weigh at least 50 to 60 pounds before they are bred. As does are often run year round with the bucks many doe kids will breed at seven to nine months of age. If doe kids are bred it is usually necessary to feed them a supplement to assure that they grow out properly and raise a good kid. If they do not breed as kids they will breed at 18 months of age. Does that do not kid by the time they are two years old should be culled.

Herd Health

All animals should be observed as often as possible to determine if there are any health problems. These symptoms might include lagging behind the herd, poor appetite, diarrhea, limping, breathing hard or fast, grunting, teeth grinding or other unusual behavior. If you suspect a problem, a more detailed examination may be required by your local veterinarian.

A normal goat at rest has a temperature of 104°F (±1°) and a heart rate of 70-80 beats per minute. The respiration rate of a mature goat is 12-15 breaths per minute. The heart and respiration rates are faster in kids. Rumen sounds or movement occur 1-2 times per minute.

Most Spanish goats are not usually vaccinated on a regular basis but some kids and mature goats are, especially before or at weaning, for enterotoxemia, soremouth and tetanus.

Enterotoxemia. Enterotoxemia affects both young and old animals and is triggered by a change in the normal rate of passage of food in the gut. Only well- or over-fed animals are usually affected by enterotoxemia. It can be prevented easily by two doses of the clostridium perfrigens types C and D vaccine (a toxoid) being given to the doe, one at four weeks and again two weeks before kidding with annual boosters to protect the doe and her kids. Kids should be vaccinated twice after weaning at two week intervals.

Soremouth. Contagious ecthyma or soremouth is a viral disease of sheep and goats. The virus is very hardy and can be picked up from the surroundings at any time. The vaccine is a live virus vaccine and should only be used if soremouth is a problem in the herd. Kids should be vaccinated within one month of birth. Adults do not need to be revaccinated again after the disease is in the herd and all young have been vaccinated. Continual exposure to the disease will keep the adults immune to the disease.

Tetanus. Tetanus or lockjaw can be prevented with two doses of tetanus toxoid and an annual booster shot. If a severe wound occurs, tetanus antitoxin can be given, especially when dehorning or castration is done.

Foot rot. Foot rot may also occur in wet soils or filthy areas although goats are not as prone to develop the condition as sheep. Keeping hooves trimmed and goats in clean, dry areas will reduce the occurrence of foot rot.

Internal Parasites

Internal parasites including stomach or intestinal roundworm and coccidia cause significant losses in productivity and goat mortality.

Roundworms. Young goats are especially affected by the roundworms which are blood sucking parasites causing anemia, diarrhea, bottle jaw or pot-bellied appearance. Treatment of goats on a regular basis by drenching (deworming with an approved anthelmintic) before pasture rotations, after kidding and before and after spring growth and rainy periods is the best prevention against parasites.

Coccidiosis. Coccidiosis is caused by a tiny parasite that lives in the cells of the goat's intestines. Crowded conditions causing contaminated feed or water and stress are primary causes of coccidiosis outbreaks. Loss of appetite, bloody diarrhea, weight loss, dull appearance and death are some of the symptoms of coccidiosis. Standard anthelmintics are not effective in controlling coccidiosis. Feed and water supplements are available and effective but the best prevention is to reduce crowding and stress.

External parasites

External parasites include lice, mange, ringworm, ticks, flies and other pests.

Lice. Lice cause itching which reduces milk production and growth rate due to irritation and blood loss. A good insecticide spray treatment that soaks the goat twice within a two-week interval will kill the adult lice and newly hatched young.

Mange. Mange is caused by two types of mites, the scab mite and the follicle mite. The scab mite causes severe itching, hair loss and scab formation while the follicle mite causes small lumps usually on the forequarters but sometimes over the entire body. Mange is difficult to control and goats should be soaked with the proper insecticide at two week intervals for two to three months.

Ringworm. Ringworm is a skin fungus that causes rough, scaly or circular areas of missing or broken hair. Treat ringworm by scrubbing

the affected area and applying iodine two to three times a week. Wettable Captan powder or thiabendazole dewormer paste rubbed in the affected area will also work well.

Ticks, Flies and Other Insects. It is very important to control ticks because they transmit other diseases. Several dips and insecticides are available for the control of these pests. Follow the recommendations carefully for livestock usage.

Forage-Related Problems

Some forage-related problems due to metabolic disorders affect goats including acidosis, indigestion, impaction, choke, bloat and grass tetany.

Acidosis. Acidosis is caused by overeating feed with high levels of easily digested starch such as grain or lush pasture. This causes the rumen function to cease, and death may result if not treated by a veterinarian.

Indigestion. Indigestion is a mild form of acidosis.

Impaction. Impaction occurs when poor quality forage is consumed faster than it is digested. Sometimes a change of feed will also slow digestion causing impaction or indigestion. In either condition, severe cases require a veterinarian.

Choke. Choke is not common in goats unless they are feeding on vegetables or fruit waste.

Bloat. Bloat is caused by the goat's inability to get rid of gas produced in the rumen (either free gas or mixed in with the feed in the rumen-frothy bloat). The goat will be in pain and have difficulty breathing and will have an enlarged and full left flank. A veterinarian's assistance is required in advance stages of bloat.

Grass tetany. Grass tetany or grass staggers is caused by goats feeding primarily on lush, green grass which is low in magnesium. Goats will be nervous and trembling and then lie down, unable to stand. It can be prevented by feeding some good hay and some grain to reduce intake or slow the passage of grass through the digestive system.

A year-long calendar has been outlined as a guide for successful Spanish goat production in Table 3 (page 10).

Marketing

Most producers market their Spanish goat kids at four to five months of age or before weaning. Some buyers pick up the kids or older goats on the ranch while other producers set up roadside vending stands in or near urban areas to market their goats especially during holiday periods. Most auction markets sell goats, but the largest goat markets are located in the Edwards Plateau area of Central Texas.

A recent survey of South Texas Spanish goat producers reported that 70 percent of the ranchers sold their goats directly off the ranch (private treaty) while only 34 percent sold their goats through the local auction. Over 25 percent used roadside vending to sell their goats. Marketing of goats is more difficult than other species due to a lack of an organized marketing and grading system and differences in demand and product availability.

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Table 4. Spanish Goat Production Calendar*

January	■ Evaluate range and forage conditions.
	■ Monitor body condition of does and supplement if necessary.
	■ Prepare for kidding.
February	■ Sort pregnant from open does.
	■ Begin feeding pregnant does.
	■ Evaluate does and bucks, sell unsound or inferior animals.
	■ Treat for internal and external parasites.
March	■ Begin kidding, check teats for milk flow, and identify kids.
	■ Separate singles from twins. If possible, pen individual does with their kids. Feed does to maintain milk production.
April	■ Finish kidding.
	■ Continue to supplement lactating does.
May	■ Consider weaning small, stunted kids.
	■ Discontinue supplement feeding to does.
	■ Monitor internal parasites through fecal samples.
June	■ Begin looking for replacement bucks with good conformation, structural correctness, muscling and a high weight per day of age.
July	■ Continue selecting replacement bucks.
	■ Monitor internal parasites through fecal samples.
August	■ Treat for internal and external parasites.
	■ Wean kids and supplement replacement does and bucks with a high protein (21 percent) high energy feed.
	■ Select replacement does and bucks
	■ Evaluate does and bucks, sell unsound and inferior animals.
	■ Criteria for culling: – Barren females - missed two seasons in a row. – Bad teats or udders - too big or too small (mastitis). – Bad mouths - smooth or broken mouth or over- or under-shot jaw. – Structural defects - bad feet and legs or back. – Bad testicles - too small or infected (epididymitis). – Unthriftiness - due to old age or disease.
September	■ Begin flushing does and bucks. Flush with fresh green pasture or 1/2 lb feed/head/day for two to three weeks before and after buck turnout.
	■ Treat for lice if necessary.
October	■ Turn out bucks with does; breeding ratio one buck per 20-25 does, depending on pasture size and breeding conditions.
	■ Continue to flush does for two to three weeks after buck turnout.
November	■ Evaluate range and forage conditions.
	■ Determine does' body condition and plan winter supplemental feeding program.
	■ Monitor internal parasite through fecal samples. If heavy, treat after first hard freeze.
December	■ Remove bucks and feed to regain body condition.
	■ Evaluate range and pasture condition.
	■ Watch body condition of does and supplement if necessary.
	■ Check for lice and use a pour-on lice treatment if needed.

*Adapted from **Texas Sheep and Goat Production Calendar**, B-1641.

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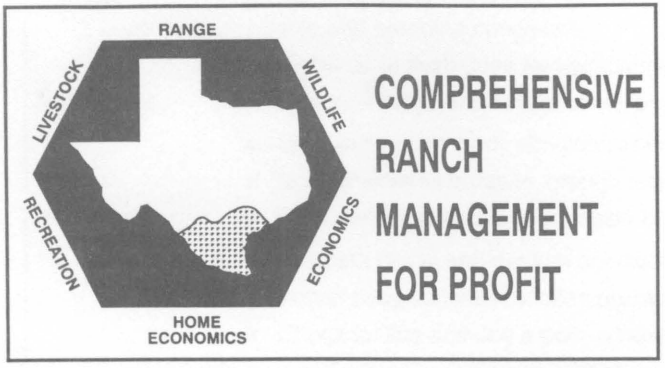

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